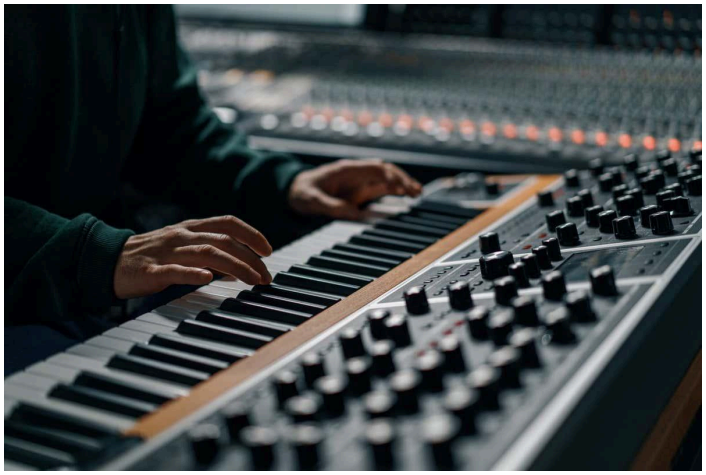
Electronic music appears to alter our state of consciousness

Listening to electronic music makes neurons in our brain fire in time with the beat, which appears to alter our reaction time and sense of unity

By Conor Feehly on February 20, 2024



Hearing electronic music can change our reaction times and the sense of unity we feel.
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Listening to electronic music seems to change our state of consciousness. Better understanding the brain mechanisms behind this could improve treatments for consciousness-related conditions, as well as enabling doctors to utilise these mechanisms to reduce stress during medical procedures.

An altered state of consciousness is generally defined as a change to our normal mental state, which can be brought about by trauma, medication or recreational drugs. This can change our awareness, as well as how we think, feel and perceive things.

Sound, especially when in a continuous pattern, has been used by cultures around the world to induce these altered states, for example drumming in ritualistic contexts.

Raquel Aparicio Terrés at the University of Barcelona in Spain wondered whether a phenomenon known as entrainment may be behind this. Entrainment occurs when synchronisation arises between an external rhythmic stimuli, such as electronic music, and the firing of neurons in the brain.

To learn more, Aparicio Terrés and her colleagues recruited 19 people, aged between 18 and 22 years old, to listen to six 1-minute extracts of electronic music at tempos of either 1.65 hertz, 2.25 Hz or 2.85 Hz. A tempo of 1.65 Hz is equivalent to 99 beats per minute. For example, house music, a genre of electronic music, typically operates at 115 to 130 beats per minute.

The researchers used electroencephalography, which measures electrical activity in the brain via electrodes attached to the scalp, to gauge the participants' neural entrainment to the music.

After hearing each extract, the participants answered a questionnaire that assessed how it affected their state of consciousness, such as the degree of unity and disembodiment they felt. They also completed various cognitive tasks that measured their focus and reaction times.

"Response variations in this task can provide insights into attentional focus and motor response readiness, which may be influenced by an altered state of consciousness," says Aparicio Terrés.

Synchronisation between the participants' brain activity and the rhythmic beat of the music occurred at all three tempos, but was most pronounced at 1.65 Hz, which is also when the participants reported feeling the most unity.

The team also found that the greater the differences in entrainment that occurred during the 1.65 Hz extract versus the 2.25 Hz extract, the bigger the differences in the participants' reaction times after the songs ended. Whether these sped up or slowed down varied among the individuals. There was no change to their focus or sense of disembodiment.

Further research should explore the connections between entrainment, reaction times and individual characteristics, such as personality traits, cognitive abilities and past experiences, according to the researchers. For instance, previous musical training could affect a person's degree of entrainment.

Aparicio Terrés says the results could have two potential medical implications. Understanding the brain mechanisms behind altered states of consciousness could inform therapeutic interventions for disorders of consciousness, such as being in a coma or vegetative state, she says. "Secondly, there is potential for using external non-invasive techniques to facilitate desirable states of detachment from reality, particularly in clinical settings such as intensive care units."

By exploring how entrainment can induce dissociative-like states, scientists could investigate its potential as a therapeutic tool to reduce stress and improve someone's overall experience during a medical treatment.

Reference:

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